PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:	Pierrick Guingo, et al.
For	:	DISTRIBUTED ARCHITECTURE FOR REAL-TIME FLOW MEASUREMENT AT THE NETWORK DOMAIN LEVEL
Serial No.:	:	10/733,393
Filed	:	December 12, 2003
Art Unit	:	2144
Examiner	:	Maceeh Anwari
Att. Docket	:	ALC 3109
Confirmation No.	:	8508

APPEAL BRIEF

Mail Stop Appeal Brief Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed January 22, 2008.

I. REAL PARTY IN INTEREST

The party in interest is ALCATEL, by way of an Assignment recorded at Reel 015117, frame 0907.

II. RELATED APPEALS AND INTERFERENCES

Following are identified any prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal:

NONE.

III. STATUS OF CLAIMS

Claims 1 and 3-26 are on appeal.

Claims 1 and 3-26 are pending.

No claims are allowed.

Claims 1 and 3-26 are rejected.

IV. STATUS OF AMENDMENTS

All Amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The subject matter recited in claim 1 relates to a method of monitoring traffic flows in a service provider domain of a communications network, the domain being logically configured as a virtual router network (Page 12, paragraph [0050], line 13; Fig. 2: 16) having virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18) at edge nodes (Page 12, paragraph [0050], line 7; Fig. 2:

14) of the virtual router network (Page 12, paragraph [0050], line 13; Fig. 2: 16), comprising the steps of: configuring said virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18) with a respective real-time flow measurement meter, said respective real-time flow measurement meter having a uniform behavior with respect to a real-time flow measurement; determining, at said virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18) and in dependence upon a flow monitoring rule set consistent for all of said virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18), whether a packet belongs to a flow to be monitored; accounting, responsive to the packet belonging to a flow to be monitored, the packet in a flow record corresponding to that flow maintained by said respective real-time flow measurement meter; and aggregating the flow records from all virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18) at a master virtual interface (Page 13, paragraph [0053], line 21; Fig. 6: 20) for transmission to a collector (Page 14, paragraph [0055], line 12; Fig. 9: 30) for enabling said service provider to identify if a specified flow record abides to terms of a corresponding service level agreement pertaining to said specified flow record.

The subject matter recited in claim 14 relates to a system for monitoring traffic flows in a service provider domain of a communications network, the domain being logically configured as a virtual router network (Page 12, paragraph [0050], line 13; Fig. 2: 16) having virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18) at edge nodes (Page 12, paragraph [0050], line 7; Fig. 2: 14) of the virtual router network, the system comprising: means for configuring said virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18) with a respective real-time flow measurement meter, said respective real-time flow measurement meter having a uniform behavior with respect to a real-time flow measurement; means at said virtual interface (Page 12, paragraph

[0052], line 28; Fig. 2: 18) for determining in dependence upon a flow monitoring rule set consistent for all of said virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18), whether a packet belongs to a flow to be monitored; means for accounting, responsive to the packet belonging to a flow to be monitored, the packet in a flow record corresponding to that flow maintained by said respective real-timeflow measurement meter; and means for aggregating the flow records from all virtual interfaces (Page 12, paragraph [0052], line 28; Fig. 2: 18) at a master virtual interface (Page 13, paragraph [0053], line 21; Fig. 6: 20) for transmission to a collector (Page 14, paragraph [0055], line 12; Fig. 9: 30).

The subject matter recited in claim 19 relates to a method of measuring per-flow traffic delay between two routers having synchronized clocks, comprising the steps of calculating, at each of the routers, a key uniquely and invariantly identifying a corresponding packet in the flow (Page 18, paragraph [0072], lines 1-8); selecting, at each of the routers using the key, a packet to be monitored (Page 18, paragraph [0073], lines 10-14); recording, at each of the routers, a timestamp upon selection of each packet (Page 18, paragraph [0074], lines 16-20); and subtracting the timestamps to determine the delay for the packet (Page 19, paragraph [0077], lines 5-13).

The subject matter recited in claim 22 relates to a computer-implemented system for measuring per-flow traffic delay between two routers having synchronized clocks, comprising means for calculating, at each of the routers, a key for every packet in the flow, wherein the key uniquely and invariantly identifies a corresponding packet in the flow (Page 18, paragraph [0072], lines 1-8); means for selecting, at each of the routers using the key, a packet to be monitored (Page 18, paragraph [0073], lines 10-14); means for recording, at each of the routers, a timestamp upon

selection of each packet (Page 18, paragraph [0074], lines 16-20); and means for subtracting the timestamps to determine the delay for the packet (Page 19, paragraph [0077], lines 5-13).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

A. Claim 10 is rejected under 35 U.S.C. § 112, first paragraph as allegedly failing to comply with the enablement requirement.

B. Claims 22-26 are rejected under 35 U.S.C. § 101 as allegedly failing to fall within a statutory category.

C. Claims 19-21 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent Publication No. 2002/0145981 to Klinker et al. (hereinafter "Klinker").

D. Claims 22-26 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent No. 6,751,191 to Kanekar et al. (hereinafter "Kanekar").

E. Claims 1 and 3-18 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kanekar in view of Klinker.

VII. ARGUMENT

A. Rejection of Claim 10 Under 35 U.S.C. § 112

In section 3 on page 2, the Final Office Action dated October 22, 2007, rejects claim 10 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the enablement requirement. Appellant respectfully traverses this rejection.

Claim 10 recites the method of claim 7 "wherein collecting aggregated flow records is performed in parallel" (emphasis added). As stated in the specification on page 14 in paragraph [0054], "a more optimized process could be considered, for example by parallelizing the tasks as shown in FIG. 8." Moreover, Fig. 8, labeled "Optimized Flow Aggregation," clearly illustrates a collection process in which two parallel processes are executed simultaneously.

Accordingly, a person of ordinary skill in the art of computer network architecture would be capable of making and using the subject matter recited in claim 10. Thus, a person of ordinary skill in the art would understand that this subject matter could be implemented by executing two or more threads simultaneously until each thread reaches the master interface, as illustrated in Fig. 8.

Furthermore, Appellant notes that, to satisfy the enablement requirement, "a patent need not teach, and preferably omits, what is well known in the art." See, e.g., *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991). Parallel execution of processes is well known in the field of computer network architecture. Thus, even assuming *arguendo* that the disclosure standing alone is insufficient to satisfy the enablement requirement, which it is not, common knowledge of those skilled in the art is sufficient to enable implementation of the subject matter recited in claim 10 without undue experimentation.

For at least the forgoing reasons, Appellant respectfully submits that claim 10 complies with all applicable requirements under 35 U.S.C. § 112.

B. Rejection of Claims 22-26 Under 35 U.S.C. § 101

In section 4 on pages 2-3, the Final Office Action dated October 22, 2007, rejects claims 22-26 under 35 U.S.C. § 101 as allegedly claiming non-statutory subject matter. Appellant respectfully traverses this rejection.

Claim 22, from which claims 23-26 depend, recites a "computer-implemented system for measuring per-flow traffic delay" (emphasis added). Because the system of claim 22 is implemented in computer hardware and includes a number of computer components, claim 22 recites the necessary physical articles or objects to constitute a machine or manufacture within the meaning of 35 U.S.C. § 101. Accordingly, the subject matter recited in claims 22-26 clearly qualifies under at least one of the statutory categories enumerated in 35 U.S.C. § 101, contrary to the assertions of the Office Action.

For at least the forgoing reasons, Appellant respectfully submits that claims 22-26 recite patentable subject matter under 35 U.S.C. § 101.

C. Rejection of Claims 19-21 Under 35 U.S.C. § 102

In section 6 on pages 4-5, the Final Office Action dated October 22, 2007, rejects Claims 19-21 under 35 U.S.C. § 102(b) as allegedly being anticipated by Klinker. Appellant respectfully traverses this rejection.

The test for anticipation under 35 U.S.C. § 102 is whether each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ.2d 1051, 1053 (Fed. Cir. 1987); M.P.E.P. § 2131. The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ.2d 1913, 1920 (Fed. Cir. 1989); M.P.E.P. § 2131. The

elements must also be arranged as required by the claim. *In re Bond*, 15 USPQ.2d 1566 (Fed. Cir. 1990).

Claim 19, from which claims 20 and 21 depend, recites "subtracting the timestamps to determine the delay for the packet" (emphasis added). Appellant respectfully submits that Klinker does not disclose, teach, or suggest this subject matter. While the sections of Klinker cited in the Office Action refer to round trip time (RTT), they are silent regarding timestamps and packet delay.

In addition, Claim 19 recites "calculating, at each of the routers, a key uniquely and invariantly identifying a corresponding packet in the flow" (emphasis added). Appellant respectfully submits that Klinker does not disclose, teach, or suggest this subject matter. None of the sections of Klinker cited in the Office Action mention a unique and invariant key.

Moreover, the system of Klinker does not calculate a key identifying a packet. Rather, the system of Klinker includes a step of "parsing the one or more data packets to retrieve packet information" (emphasis added). See paragraphs [0015], [0053]. In other words, the system of Klinker simply retrieves packet information from the received data packets, without including a step to calculate a key based on the packet information.

Claim 19 additionally recites "selecting, at each of the routers using the key, a packet to be monitored" (emphasis added). Appellant respectfully submits that Klinker does not disclose, teach, or suggest this subject matter. The system of Klinker does not select a packet using a calculated key. Rather, as described in Klinker, "Passive flow analyzer 165 operates to instantaneously monitor service levels of all traffic received by passive flow analyzer 165" (emphasis added). See paragraph

[0053]. In other words, the system of Klinker indiscriminately analyzes traffic, without first selecting a packet to be monitored using a key. See paragraph [0053].

For at least the forgoing reasons, Appellant respectfully submits that claim 19 is patentable over Klinker because Klinker fails to disclose, teach, or suggest each and every element recited in claim 19. Claims 20 and 21 depend from claim 19 and are therefore allowable for at least the reasons stated in connection with claim 19, as well as for the separately patentable subject matter recited therein.

D. Rejection of Claims 22-26 Under 35 U.S.C. § 102

In section 7 on pages 5-7, the Final Office Action dated October 22, 2007, rejects Claims 19-21 under 35 U.S.C. § 102(e) as allegedly being anticipated by Kanekar. Appellant respectfully traverses this rejection.

Claim 22, from which claims 23-26 depend, recites "means for subtracting the timestamps to determine the delay for the packet" (emphasis added). Appellant respectfully submits that Kanekar does not disclose, teach, or suggest this subject matter. The first section of Kanekar cited in the Office Action, lines 54-65 of column 10, describes a task "to synchronize the port states and forward delay time" but does not disclose subtraction of timestamps. Similarly, the second section of Kanekar, lines 22-26 of column 13, only recites forwarding "upon failure of the master without a period of delay." Thus, Kanekar provides no disclosure of subtraction of timestamps.

Claim 22 recites "means for calculating, at each of the routers, a key uniquely and invariantly identifying a corresponding packet in the flow" (emphasis added). Appellant respectfully submits that Kanekar does not disclose, teach, or suggest this subject matter. The system of Kanekar does not calculate a key identifying a packet. Rather, as described in Kanekar, "The slave's forwarding engine observes packets at the shared interfaces to obtain information from the packet header to establish shortcuts." See col. 3, ln. 34-49. In other words, Kanekar simply retrieves information from packet headers, without including a step to calculate a key based on the packet information.

Moreover, claim 22 recites "means for selecting, at each of the routers using the key, a packet to be monitored" (emphasis added). Appellant respectfully submits that Kanekar does not disclose, teach, or suggest this subject matter. The system of Kanekar does not select a packet using a

calculated key. Rather, as described in Kanekar, "During normal operation, prior to failure of the master, both the slave and master each monitor all traffic coming into the switch." See col. 14, ln. 36-40. "Based upon the header of the incoming packet, an entry in the corresponding layer 2 table is created." Id. Thus, the system of Kanekar adds every packet to an entry in the corresponding layer 2 table and does not select packets to be monitored using a key.

For at least the forgoing reasons, Appellant respectfully submits that claim 22 is patentable over Kanekar because Kanekar fails to disclose, teach, or suggest each and every element recited in claim 22. Claims 23-26 depend from claim 22 and are therefore allowable for at least the reasons stated in connection with claim 22, as well as for the separately patentable subject matter recited therein.

E. Rejection of Claims 1, 3-18 Under 35 U.S.C. § 103

In section 9 on pages 7-13, the Final Office Action, dated October 22, 2007, rejects Claims 1, 3-18 under 35 U.S.C. § 103(a) as allegedly unpatentable over Kanekar in view of Klinker. Appellant respectfully traverses this rejection.

Claims 1 and 14, from which claims 3-13 and 15-18 depend, respectively, recite "aggregating the flow records from all virtual interfaces at a master virtual interface for transmission to a collector" (emphasis added). Appellant respectfully submits that Kanekar does not disclose, teach, or suggest this subject matter.

Kanekar relates to a load sharing and redundancy scheme. The specification of Kanekar states that "during normal operation, prior to failure of the master, both the slave and the master each monitor all traffic coming into the switch." See col. 14, ln. 36-40. "Based upon the header of the

incoming packet, an entry in the corresponding layer 2 table is created." Id. "In addition, the master and the slave router each maintain their own layer 3 shortcut table." See col. 14, ln. 60-62.

Thus, although the routers of Kanekar monitor incoming traffic and create a record of that traffic, they do not aggregate the records at a master virtual interface. Rather, each router has its own layer 2 and layer 3 tables and the data from these tables is not combined at the master router to form a single set of flow records. In addition, the system of Kanekar does not include a step of "transmission to a collector." Instead, the tables are maintained in each router for use of only the router itself.

Accordingly, Kanekar fails to disclose, teach, or suggest "aggregating the flow records from all virtual interfaces at a master virtual interface for transmission to a collector," as recited in claims 1 and 14. Klinker fails to overcome the deficiencies in Kanekar discussed above.

For at least the forgoing reasons, Appellant respectfully submits that claims 1 and 14 are patentable over Kanekar in view of Klinker. Claims 3-13 depend from claim 1 and are therefore allowable for at least the reasons stated above in connection with claim 1, as well as for the separately patentable subject matter recited therein. Claims 15-18 depend from claim 14 and are therefore allowable for at least the reasons stated above in connection with claim 14, as well as for the separately patentable subject matter recited therein.

CONCLUSION

For at least the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 1 and 3-26 are in condition for allowance. For at least the above reasons, Appellants respectfully request that this Honorable Board reverse the rejections of claims 1 and 3-26.

Respectfully submitted,
KRAMER & AMADO, P.C.

April 23, 2008
Date

Terry W. Kramer
Reg. No. 41,541

KRAMER & AMADO, P.C.
1725 Duke Street, Suite 240
Alexandria, VA 22314
Tel. (703) 519-9801
Fax. (703) 519-9802

VIII. CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

1. (Previously Presented) A method of monitoring traffic flows in a service provider domain of a communications network, the domain being logically configured as a virtual router network having virtual interfaces at edge nodes of the virtual router network, comprising the steps of:

a) configuring said virtual interfaces with a respective real-time flow measurement meter, said respective real-time flow measurement meter having a uniform behavior with respect to a real-time flow measurement

b) determining, at said virtual interfaces and in dependence upon a flow monitoring rule set consistent for all of said virtual interfaces, whether a packet belongs to a flow to be monitored;

c) accounting, responsive to the packet belonging to a flow to be monitored, the packet in a flow record corresponding to that flow maintained by said respective real-time flow measurement meter; and

d) aggregating the flow records from all virtual interfaces at a master virtual interface for transmission to a collector for enabling said service provider to identify if a specified flow record abides to terms of a corresponding service level agreement pertaining to said specified flow record.

2. (Canceled).

3. (Previously Presented) The method as defined in claim 1, further comprising an initial step of selecting one of the virtual interfaces as the master virtual interface.

4. (Original) The method as defined in claim 3 wherein the step of selecting the master virtual interface is done by polling each of the virtual interfaces to determine which one best satisfies a selection criteria.

5. (Original) The method as defined in claim 4 wherein the selection criteria includes CPU usage, traffic handling capability and memory capacity.

6. (Original) The method as defined in claim 3, further comprising following the selecting step, initiating, by the master virtual interface, distribution of the rule set to the other virtual interfaces.

7. (Original) The method as defined in claim 3 comprising following the selection step, by the master virtual interfaces, collecting aggregated flow records from the other virtual interfaces.

8. (Previously Presented) The method as defined in claim 7, wherein the aggregated flow records are sent to the collector by the master virtual interface.

9. (Previously Presented) The method as defined in claim 7 wherein collecting aggregated flow records is performed serially.

10. (Previously Presented) The method as defined in claim 7 wherein collecting aggregated flow records is performed in parallel.

11. (Original) The method as defined in claim 7 wherein the aggregated flow records are provided to the collector using either a push or a pull collector operation.

12. (Original) The method as defined in claim 6 wherein a service manager initiates the triggering selection process by sending a new or updated rule set to the master.

13. (Original) The method as defined in claim 12 wherein the service manager receives aggregated flow records from the collector.

14. (Previously Presented) A system for monitoring traffic flows in a service provider domain of a communications network, the domain being logically configured as a virtual router network having virtual interfaces at edge nodes of the virtual router network, the system comprising:

means for configuring said virtual interfaces with a respective real-time flow measurement meter, said respective real-time flow measurement meter having a uniform behavior with respect to a real-time flow measurement;

means at said virtual interface for determining in dependence upon a flow monitoring rule set consistent for all of said virtual interfaces, whether a packet belongs to a flow to be monitored;

means for accounting, responsive to the packet belonging to a flow to be monitored, the packet in a flow record corresponding to that flow maintained by said respective real-timeflow measurement meter; and

means for aggregating the flow records from all virtual interfaces at a master virtual interface for transmission to a collector.

15. (Previously Presented) The system as defined in claim 14 wherein one of said virtual interfaces is selected as the master virtual interface.

16. (Original) The system as defined in claim 15 wherein the master virtual interface has means to distribute rule sets to other virtual interfaces.

17. (Original) The system as defined in claim 16 wherein the master virtual interface has means to collect aggregated flow records from the other virtual interfaces and to report the aggregated flow records to a collector.

18. (Original) The system as defined in claim 17 having a service manager to initiate a selection of the master virtual interface and to collect aggregated flow records from the collector.

19. (Previously Presented) A method of measuring per-flow traffic delay between two routers having synchronized clocks, comprising the steps of:

a) calculating, at each of the routers, a key uniquely and invariantly identifying a corresponding packet in the flow;

b) selecting, at each of the routers using the key, a packet to be monitored;

c) recording, at each of the routers, a timestamp upon selection of each packet; and

e) subtracting the timestamps to determine the delay for the packet.

20. (Original) The method as defined in claim 19 wherein multiple packets are monitored and an average delay for the multiple packets is calculated.

21. (Previously Presented) The method as defined in claim 20 wherein if a key cannot be calculated within a given time interval indicating lost packets the calculating step is stopped.

22. (Previously Presented) A computer-implemented system for measuring per-flow traffic delay between two routers having synchronized clocks, comprising:

means for calculating, at each of the routers, a key for every packet in the flow, wherein the key uniquely and invariantly identifies a corresponding packet in the flow;

means for selecting, at each of the routers using the key, a packet to be monitored; means for recording, at each of the routers, a timestamp upon selection of each packet; and

means for subtracting the timestamps to determine the delay for the packet.

23. (Original) The system as defined in claim 22 wherein the routers are edge routers in a virtual router network.

24. (Original) The system as defined in claim 23 wherein one of said edge routers is selected as a master edge router and packet filtering information is aggregated and correlated at said master edge router.

25. (Original) The system as defined in claim 23 wherein one of said edge routers is selected as a master edge router and the aggregation and correlation processes of packet filtering information are distributed among the edge routers, the results being sent and compiled at said master edge router.

26. (Original) The system as defined in claim 24 having a service manager to receive said packet filtering information.

IX. EVIDENCE APPENDIX

A copy of the following evidence 1) entered by the Examiner, including a statement setting forth where in the record the evidence was entered by the Examiner, 2) relied upon by the Appellant in the appeal, and/or 3) relied upon by the Examiner as to the grounds of rejection to be reviewed on appeal, is attached:

NONE

X. RELATED PROCEEDINGS APPENDIX

Copies of relevant decisions in prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal are attached:

NONE